



SEQUENCE LISTING

<10> Board of Regents, The University of Texas System  
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Herzog, Norbert  
Tang, Xian B.

<120> BEAD BOUND COMBINATORIAL OLIGONUCLEOSIDE PHOSPHOROTHIOATE AND  
PHOSPHORODITHIOATE APTAMER LIBRARIES

<130> UTMB:1024

<140> 10/828935  
<141> 2004-04-21

<150> 60/334,887  
<151> 2001-11-15

<150> 10/272,509  
<151> 2002-10-16

<160> 70

<170> PatentIn version 3.3

<210> 1  
<211> 15  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> misc\_feature  
<223> Description of Artificial Sequence: synthetic oligonucleotide

<400> 1  
ggatccggtg gtctg 15

<210> 2  
<211> 15  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> misc\_feature  
<223> Description of Artificial Sequence: synthetic oligonucleotide

<400> 2  
cctactcgcg aattc 15

<210> 3  
 <211> 23  
 <212> DNA  
 <213> artificial  
  
 <220>  
 <223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(23)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23.  
  
 <400> 3  
 cagttgaggg gactttccca ggc 23  
  
 <210> 4  
 <211> 23  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(23)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23.  
  
 <400> 4  
 cctgcacatc tcaggatgac ttt 23  
  
 <210> 5  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(22)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 4, 8, 9, 16, 19.  
  
 <400> 5  
 atgtagccag ctagtctgtc ag 22

<210> 6  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> modified\_base  
<222> (1)..(22)  
<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 5, 9, 10, 16, 19.

<400> 6  
cgcccagtga aggtggaacc cc 22

<210> 7  
<211> 50  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> misc\_feature  
<223> Description of Artificial Sequence: synthetic oligonucleotide

<400> 7  
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<210> 8  
<211> 52  
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<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> misc\_feature  
<223> Description of Artificial Sequence: synthetic oligonucleotide

<400> 8  
cctactcgcg aattcagttg aggggacttt cccaggcgga tccggtggtc tg 52

<210> 9  
<211> 18  
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<220>  
<223> Synthetic oligonucleotide.

<220>  
 <221> misc\_feature  
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 <400> 9  
 atgcctactc gcgaattc 18  
  
 <210> 10  
 <211> 18  
 <212> DNA  
 <213> Artificial  
  
 <220>  
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 <220>  
 <221> misc\_feature  
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 <400> 10  
 gaacagacca ccg gatcc 18  
  
 <210> 11  
 <211> 22  
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 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> misc\_feature  
 <223> Description of Artificial Sequence: synthetic oligonucleotide  
  
 <400> 11  
 ctgtgagtcg actgatgacg gt 22  
  
 <210> 12  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
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 <400> 12  
 agttgagtcg aaggacccat tt 22

<210> 13  
 <211> 22  
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 <220>  
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 <220>  
 <221> misc\_feature  
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 <400> 13  
 cgtcaagtct cagttcccat tt 22  
  
 <210> 14  
 <211> 22  
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 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> misc\_feature  
 <223> Description of Artificial Sequence: synthetic oligonucleotide  
  
 <400> 14  
 agtcaagtcg aagttccacg gt 22  
  
 <210> 15  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(22)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or  
 dithiophosphate at positions 2, 8, 14, 16, 22.  
  
 <400> 15  
 ctgtgagtcg actgatgacg gt 22  
  
 <210> 16  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>

<223> Synthetic oligonucleotide.

<220>

<221> modified\_base

<222> (1)..(22)

<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 8, 12, 14, 20, 22.

<400> 16

agttgagtcg aaggacccat tt

22

<210> 17

<211> 22

<212> DNA

<213> Artificial

<220>

<223> Synthetic oligonucleotide.

<220>

<221> modified\_base

<222> (1)..(22)

<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 4, 8, 10, 12, 20, 22.

<400> 17

cgtcaagtct cagttcccat tt

22

<210> 18

<211> 22

<212> DNA

<213> Artificial

<220>

<223> Synthetic oligonucleotide.

<220>

<221> modified\_base

<222> (1)..(22)

<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 4, 8, 12, 18, 22.

<400> 18

agtcaagtcg aagttccacg gt

22

<210> 19

<211> 22

<212> DNA

<213> Artificial

<220>

<223> Artificial oligonucleotide.

<220>  
<221> misc\_feature  
<223> Description of Artificial Sequence: synthetic oligonucleotide  
  
<400> 19  
atgtagccag ctagtctgtc ag 22

<210> 20  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> misc\_feature  
<223> Description of Artificial Sequence: synthetic oligonucleotide  
  
<400> 20  
cgccagccaa aggtgctgtc ag 22

<210> 21  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> misc\_feature  
<223> Description of Artificial Sequence: synthetic oligonucleotide  
  
<400> 21  
cgcccagtggt ctagtgaacc cc 22

<210> 22  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> misc\_feature  
<223> Description of Artificial Sequence: synthetic oligonucleotide  
  
<400> 22  
atgtagccga aggtggaacc cc 22

<210> 23

<211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> misc\_feature  
 <223> Description of Artificial Sequence: synthetic oligonucleotide  
  
 <400> 23  
 cgccagccga aggtggaacc cc 22  
  
 <210> 24  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> misc\_feature  
 <223> Description of Artificial Sequence: synthetic oligonucleotide  
  
 <400> 24  
 atgtagccag ctagtctgtc ag 22  
  
 <210> 25  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(22)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or  
 dithiophosphate at positions 10.  
  
 <400> 25  
 cgccagccaa aggtgctgtc ag 22  
  
 <210> 26  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.



<220>  
 <221> modified\_base  
 <222> (1)..(22)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or  
 dithiophosphate at positions 5, 9, 16, 17.  
  
 <400> 26  
 cgcccagtggt ctagtgaacc cc 22  
  
 <210> 27  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(22)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or  
 dithiophosphate at positions 9, 10, 16, 17.  
  
 <400> 27  
 atgtagccga aggtggaacc cc 22  
  
 <210> 28  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(22)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or  
 dithiophosphate at positions 10, 11, 17, 18.  
  
 <400> 28  
 cgccagccga aggtggaacc cc 22  
  
 <210> 29  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> misc\_feature

<223> Description of Artificial Sequence: synthetic oligonucleotide

<400> 29  
ggggttccac cttcactggg cg 22

<210> 30  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> misc\_feature  
<223> Description of Artificial Sequence: synthetic oligonucleotide

<400> 30  
ccccaaggtg gaagtgaccc gc 22

<210> 31  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> modified\_base  
<222> (1)..(22)  
<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 10.

<400> 31  
cgccagccga aggtgctgtc ag 22

<210> 32  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> modified\_base  
<222> (1)..(22)  
<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 10, 16, 17.

<400> 32  
atgtagccaa aggtggaacc cc 22

<210> 33  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(22)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or  
 dithiophosphate at positions 5, 9, 10.  
  
 <400> 33  
 cgcccagtgagggtgctgtc ag 22  
  
 <210> 34  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(22)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or  
 dithiophosphate at positions 4.  
  
 <400> 34  
 cgcccagtagctagtctgtc ag 22  
  
 <210> 35  
 <211> 15  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> misc\_feature  
 <223> Description of Artificial Sequence: synthetic oligonucleotide  
  
 <400> 35  
 ggatccggtggtctg 15  
  
 <210> 36  
 <211> 15  
 <212> DNA  
 <213> Artificial

<220>  
 <223> Synthetic oligonucleotide.

<220>  
 <221> misc\_feature  
 <223> Description of Artificial Sequence: synthetic oligonucleotide

<400> 36  
 cctactcgcg aattc 15

<210> 37  
 <211> 14  
 <212> DNA  
 <213> Artificial

<220>  
 <223> Synthetic oligonucleotide.

<220>  
 <221> modified\_base  
 <222> (1)..(14)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or  
 dithiophosphate at positions 9, 10.

<400> 37  
 ccaggagatt ccac 14

<210> 38  
 <211> 14  
 <212> DNA  
 <213> Artificial

<220>  
 <223> Synthetic oligonucleotide.

<220>  
 <221> modified\_base  
 <222> (1)..(14)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or  
 dithiophosphate at positions 3, 13.

<400> 38  
 gtggaatctc ctgg 14

<210> 39  
 <211> 14  
 <212> DNA  
 <213> Artificial

<220>  
 <223> Synthetic oligonucleotide.

<220>  
 <221> modified\_base  
 <222> (1)..(14)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 4, 5, 10, 11.  
  
 <400> 39  
 ccaggagatt ccac 14  
  
 <210> 40  
 <211> 14  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(14)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 9, 11, 12.  
  
 <400> 40  
 gtggaatcyc cygg 14  
  
 <210> 41  
 <211> 30  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(30)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at position 1.  
  
 <400> 41  
 ccaggagatt ccacggatcc ggtggtctgt 30  
  
 <210> 42  
 <211> 45  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> modified\_base  
 <222> (16)..(16)

<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate.

<400> 42  
cctactcgcg aattcccagg agattccacg gatccggtgg tctgt 45

<210> 43  
<211> 14  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> modified\_base  
<222> (1)..(14)  
<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 5, 9, 13.

<400> 43  
ccagtgactc agtg 14

<210> 44  
<211> 14  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> modified\_base  
<222> (1)..(14)  
<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 4, 8, 12,

<400> 44  
ggtcactgag tcac 14

<210> 45  
<211> 14  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> modified\_base  
<222> (1)..(14)  
<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 10, 11.

<400> 45  
ccaggagatt ccac 14

<210> 46  
<211> 14  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> modified\_base  
<222> (1)..(14)  
<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 4, 7, 9, 14.

<400> 46  
ggtcctctaa ggtg 14

<210> 47  
<211> 14  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> modified\_base  
<222> (1)..(14)  
<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 10, 11.

<400> 47  
ccaggagatt ccac 14

<210> 48  
<211> 14  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> modified\_base  
<222> (1)..(14)  
<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 4, 7, 9, 14.

<400> 48  
ggtcctctaa ggtg 14

<210> 49  
<211> 24  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> misc\_feature  
<223> Description of artificial sequence: synthetic oligonucleotide

<400> 49  
agttgagggg actttcccag gctt 24

<210> 50  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> misc\_feature  
<223> Description of artificial sequence: synthetic oligonucleotide

<400> 50  
gcctgggaaa gtcccctcaa ct 22

<210> 51  
<211> 14  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> modified\_base  
<222> (1)..(14)  
<223> wherein at least one nucleotide is an achiral thiophosphate or  
dithiophosphate at positions 10, 11.

<400> 51  
ccaggagatt ccac 14

<210> 52  
<211> 14  
<212> DNA  
<213> Artificial

<220>



<223> Synthetic oligonucleotide.

<220>

<221> modified\_base

<222> (1)..(14)

<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 3, 7, 9, 13.

<400> 52

gtggaatctc ctgg

14

<210> 53

<211> 22

<212> DNA

<213> Artificial

<220>

<223> Synthetic oligonucleotide.

<220>

<221> modified\_base

<222> (1)..(22)

<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 6, 10, 11, 17, 18

<400> 53

cgcccagtga aggtggaacc cc

22

<210> 54

<211> 22

<212> DNA

<213> Artificial

<220>

<223> Synthetic oligonucleotide.

<220>

<221> modified\_base

<222> (1)..(22)

<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 9, 15.

<400> 54

ggggttccac cttcactggg cg

22

<210> 55

<211> 22

<212> DNA

<213> Artificial

<220>

<223> Synthetic oligonucleotide.

<220>  
 <221> modified\_base  
 <222> (1)..(22)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or  
 dithiophosphate at positions 6, 10, 18.  
  
 <400> 55  
 cgcccagtga aggtggaacc cc 22  
  
 <210> 56  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(22)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or  
 dithiophosphate at positions 9, 15.  
  
 <400> 56  
 ggggttccac cttcactggg cg 22  
  
 <210> 57  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(22)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or  
 dithiophosphate at positions 6, 18.  
  
 <400> 57  
 cgcccagtga aggtggaacc cc 22  
  
 <210> 58  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> Synthetic oligonucleotide.  
  
 <220>  
 <221> modified\_base  
 <222> (1)..(22)

<223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 9, 15.

<400> 58  
 ggggttccac cttcactggg cg 22

<210> 59  
 <211> 22  
 <212> DNA  
 <213> Artificial

<220>  
 <223> Synthetic oligonucleotide.

<220>  
 <221> modified\_base  
 <222> (1)..(22)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 6, 11, 12, 18, 19.

<400> 59  
 cgcccagtga aggtggaacc cc 22

<210> 60  
 <211> 22  
 <212> DNA  
 <213> Artificial

<220>  
 <223> Synthetic oligonucleotide.

<220>  
 <221> misc\_feature  
 <223> Description of artificial sequence: synthetic oligonucleotide

<400> 60  
 ggggttccac cttcactggg cg 22

<210> 61  
 <211> 22  
 <212> DNA  
 <213> Artificial

<220>  
 <223> Synthetic oligonucleotide.

<220>  
 <221> modified\_base  
 <222> (1)..(22)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 6, 10, 18.

<400> 61  
 cgcccagtga aggtggaacc cc 22

<210> 62  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> misc\_feature  
<223> Description of artificial sequence: synthetic oligonucleotide

<400> 62  
ggggttccac cttcactggg cg 22

<210> 63  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> modified\_base  
<222> (1)..(22)  
<223> wherein at least one nucleotide is an achiral thiophosphate or  
dithiophosphate at positions 6, 18.

<400> 63  
cgcccagtga aggtggaacc cc 22

<210> 64  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
<223> Synthetic oligonucleotide.

<220>  
<221> misc\_feature  
<223> Description of artificial sequence: synthetic oligonucleotide

<400> 64  
ggggttccac cttcactggg cg 22

<210> 65  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
 <223> Synthetic oligonucleotide.

<220>  
 <221> misc\_feature  
 <223> Description of artificial sequence: synthetic oligonucleotide

<400> 65  
 cgcccagtga aggtggaacc cc 22

<210> 66  
 <211> 22  
 <212> DNA  
 <213> Artificial

<220>  
 <223> Synthetic oligonucleotide.

<220>  
 <221> modified\_base  
 <222> (1)..(22)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 9, 15.

<400> 66  
 ggggttcac cttcactggg cg 22

<210> 67  
 <211> 31  
 <212> RNA  
 <213> Artificial

<220>  
 <223> Artificial oligonucleotide.

<220>  
 <221> modified\_base  
 <222> (1)..(31)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or dithiophosphate at positions 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 19, 31, 33.

<400> 67  
 gauccugaaa cuguuuuaag guuggccgau c 31

<210> 68  
 <211> 31  
 <212> RNA  
 <213> Artificial

<220>  
 <223> Artificial oligonucleotide.

<220>  
 <221> modified\_base  
 <222> (1)..(31)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or  
 dithiophosphate at positions 3, 5, 7, 9, 11, 13, 15, 17, 19, 21,  
 23, 25, 27, 29, 31.

<400> 68  
 cuaggacuug gcacaaccgu cacacugcua u 31

<210> 69  
 <211> 61  
 <212> DNA  
 <213> Artificial

<220>  
 <223> Artificial oligonucleotide.

<220>  
 <221> modified\_base  
 <222> (1)..(61)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or  
 dithiophosphate at positions 3, 5, 7, 9, 11, 13, 15, 17, 19, 21,  
 23, 25, 27, 29, 31.

<400> 69  
 cctactcgcg aattccuagg acuuggcaca accgucacac ugcuaagggat ccggtggtct 60  
 g 61

<210> 70  
 <211> 61  
 <212> DNA  
 <213> Artificial

<220>  
 <223> Artificial oligonucleotide.

<220>  
 <221> modified\_base  
 <222> (1)..(61)  
 <223> wherein at least one nucleotide is an achiral thiophosphate or  
 dithiophosphate at positions 3, 5, 7, 9, 11, 13, 15, 17, 19, 21,  
 23, 25, 27, 29, 31.

<400> 70  
 cctactcgcg aattcgaucc ugaaacuguu uuaagguugg ccgaucggat ccggtggtct 60  
 g 61